

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION

REVISED CLEANUP AND ABATEMENT ORDER NO. R9-2009-0124
(Revised December 23, 2009)

AN ORDER DIRECTING CHEVRON USA, INC.
TO CLEANUP AND ABATE THE EFFECTS OF POLLUTION AND NUISANCE AND
SUBMIT TECHNICAL REPORTS PERTAINING TO SITE ASSESSMENT
AND CORRECTIVE ACTION

AT

CHEVRON SERVICE STATION NO. 9-3417
32001 CAMINO CAPISTRANO
SAN JUAN CAPISTRANO, CALIFORNIA

The California Regional Water Quality Control Board, San Diego Region
(hereinafter Regional Board) finds that:

- 1. Legal and Regulatory Authority:** This Order conforms to and implements policies and requirements of the Porter-Cologne Water Quality Control Act (Division 7, commencing with Water Code section 13000) including (1) sections 13267 and 13304; (2) applicable State and federal regulations; (3) all applicable provisions of Statewide Water Quality Control Plans adopted by the State Water Resources Control Board (State Board) and the *Water Quality Control Plan, San Diego Basin* (Basin Plan) adopted by the Regional Board including beneficial uses, water quality objectives, and implementation plans; (4) State Board policies and regulations, including State Board Resolution No. 68-16 (*Statement of Policy with Respect to Maintaining High Quality of Waters in California*), Resolution No. 88-63 (*Sources of Drinking Water*), and Resolution No. 92-49 (*Policies and Procedures for Investigation and Cleanup and Abatement of Discharges under California Water Code Section 13304*); California Code of Regulations (CCR) Title 23, Division 3, Chapter 16, Article 11; CCR Title 23; section 3890 et. seq.; and (5) relevant standards, criteria, and advisories adopted by other State and federal agencies.
- 2. Unauthorized Discharge of Petroleum Hydrocarbon Wastes:** Chevron Service Station No. 9-3417, located at 32001 Camino Capistrano, San Juan Capistrano, California began operation in 1972 and has undergone several upgrades. Discharges of gasoline from the USTs have resulted in a methyl tertiary butyl ether (MTBE) plume in groundwater that extends approximately 2,400 feet south of the facility. The MTBE plume extends to the south (downgradient) to the Dance Hall Well, a municipal water supply well owned and operated by the City of San Juan Capistrano (City).

In early 2008 the City discontinued use of the Dance Hall Well due to the presence of MTBE in the extracted groundwater. A groundwater sample collected from the Dance Hall Well was reported by the City to have a MTBE concentration of 1.3 micrograms per liter ($\mu\text{g/l}$). The health-based primary maximum contaminant level (MCL) for MTBE is 13 $\mu\text{g/l}$. The secondary MCL, which is a taste and odor threshold, is 5 $\mu\text{g/l}$. Although the reported groundwater MTBE concentration is below the secondary MCL, the City elected to shut down the well to eliminate the potential of distributing groundwater with MTBE to its residents.

The following table presents the highest concentration of selected compounds detected within the plume during the most recent groundwater sampling.

<i>Compound</i>	<i>Maximum Groundwater Concentration ($\mu\text{g/L}$)</i>
Benzene	2.8
MTBE	46

3. **Persons Named as Responsible Parties:** Chevron USA, Inc.² (Chevron) is named as a Responsible Party because it owns and operates the retail gasoline station known as Chevron Service Station No. 9-3417 (hereinafter the Facility) where discharges of gasoline occurred from the underground storage tank system (UST).¹ These petroleum hydrocarbons are not naturally occurring and are wastes, as defined in Water Code section 13050(d).

As an interim cleanup action, Chevron proposes pumping the City's Dance Hall Well to capture and contain the MTBE plume, and further proposes treating the pumped groundwater to remove petroleum hydrocarbon wastes.

4. Potentially Responsible Parties

The City operates a series of municipal water supply wells, including the Dance Hall Well, which are located in a geographic line approximately parallel to the flow of the MTBE plume. The City's municipal supply wells are downgradient from the identified petroleum hydrocarbon discharge source(s). The City has denied Chevron access to the City's property, including the Dance Hall Well. Therefore Chevron has been unable to implement the Interim Remedial Action described in the March 26, 2008 Interim Remedial Action Plan (IRAP)² which was approved by the County of Orange Health Care Agency, Environmental

¹ The UST system included the tanks, piping, and dispensers.

² Interim Remedial Action Plan, Chevron Station 9-3417, 32001 Camino Capistrano, San Juan Capistrano, California, prepared by Conestoga-Rovers & Associates, dated March 26, 2008.

Health Division. Access to the City's property is necessary for Chevron to capture and contain the MTBE plume, either by using the Dance Hall Well or an alternative approach. The Regional Board will amend this CAO to add the City as a Responsible Party if the City unreasonably denies Chevron access to the City's property for the purpose of capturing and containing the MTBE plume.

The Regional Board may properly find the City is a Responsible Party pursuant to Water Code section 13304. Water Code section 13304 states that "[a]ny person...who has caused or permitted, causes or permit, or threatens to cause or permit any waste to be discharged..." may be named as a Responsible Party. A discharge of waste includes passive migration of waste after the initial discharge.³ The City, by not allowing Chevron reasonable access to the Dance Hall Well or other areas of the City's property, would be contributing to the discharge of waste, and contributing to the migration of the MTBE plume beyond the Dance Hall Well, threatening other water supply wells. As the owner and operator of the Dance Hall Well, the City has the ability to allow Chevron reasonable access to City property to arrest the spread of the plume and abate the condition of waste that exists in groundwater or to undertake these activities itself. In addition, the City is ultimately responsible for its property.⁴

5. **Water Quality Standards:** The Site is located within the Lower San Juan Hydrologic Subarea (HSA) (901.27) of the San Juan Hydrologic Unit (901.00). Groundwater in the San Juan HSA is designated in the Basin Plan as having existing beneficial uses for municipal and domestic water supply (MUN),⁵ agricultural supply water (AGR), and industrial service supply (IND). The Basin Plan contains numeric water quality objectives⁶ for chemical constituents to protect groundwater designated for MUN use. The numeric objectives are derived from primary MCLs⁷ established by the Department of Health Services (Department) in

³ In the Matter of Zoecon Corporation, Order No. 86-2 (State Board, 1986).

⁴ In the Matter of Arthur Spitzer, et al., Order No. 89-8 (State Board, 1989).

⁵ See Water Quality Control Plan for the San Diego Basin (Basin Plan), Page 2-3. The Basin Plan defines MUN as "uses of water for community, military, or individual water supply systems including, but not limited to, drinking water supply."

⁶ "Water quality objectives" are defined in Water Code section 13050(h) as "the limits or levels of water quality constituents or characteristics which are established for the reasonable protection of beneficial uses of water or the prevention of nuisance within a specific area."

⁷ MCLs, maximum contaminant levels, are public health-protective drinking water standards to be met by public water systems. MCLs take into account not only chemicals' health risks but also factors such as their delectability and treatability, as well as the costs of treatment. Primary MCLs can be found in Title 22 California Code of Regulations (CCR) sections 64431 - 64444. Secondary MCLs address the taste, odor, or appearance of drinking water, and are found in 22 CCR section 64449.

Title 22 of the California Code of Regulations.⁸ Groundwater concentrations of benzene and MTBE are not in conformance with the water quality objectives needed to support MUN uses of the groundwater, creating a condition of pollution and nuisance in water of the State.

Groundwater is currently used for municipal and domestic supply. The San Juan Capistrano Groundwater Recovery Plant (GWRP), which began operation in 2005, consists of six groundwater production wells, and a greensand filter and reverse osmosis treatment system. The GWRP, which includes the Dance Hall Well, can extract and treat up to 5.1 million gallons per day of highly mineralized groundwater. The GWRP was designed to supply virtually all of San Juan Capistrano's winter needs and half of its summer needs.

6. **Basis of Cleanup and Abatement Order:** Water Code section 13304 contains the cleanup and abatement authority of the Regional Board. Water Code section 13304 requires a person to clean up waste and/or abate the effects of the waste discharge if so ordered by a regional board in the event there has been a discharge in violation of waste discharge requirements, or if a person has caused or permitted waste to be discharged or deposited where it is, or probably will be, discharged into the waters of the State and creates or threatens to create a condition of pollution or nuisance. Therefore, based on the previous findings the Regional Board is authorized to order Chevron to cleanup and abate the effects of the waste discharge(s).
7. **Basis for Requiring Reports:** Water Code section 13267 provides that the Regional Water Board may require dischargers, past dischargers, or suspected dischargers to furnish those technical or monitoring reports as the Regional Water Board may specify, provided that the burden, including costs, of these reports, shall bear a reasonable relationship to the need for the reports and the benefits to be obtained from the reports. In requiring the reports, the Regional Board must provide the person with a written explanation with regard to the need for the reports, and identify the evidence that supports requiring that person to provide the reports.
8. **Need for Technical and Monitoring Reports:** Technical reports and Monitoring reports required by this Order are needed to provide information to the Regional Board regarding (a) the nature and extent of the discharge, (b) the nature and extent of pollution conditions in State waters created by the

⁸ Basin Plan, footnote 1, supra. Page 3-24 and Table 3-5 at 3-25. The Basin Plan provides that "Water designated for use as domestic or municipal supply (MUN) shall not contain concentrations of chemical constituents in excess of the maximum contaminant levels specified in California Code of Regulations, Title 22, Table 64444-A of section 64444 (Organic Chemicals) which is incorporated by reference into this plan. This incorporation by reference is prospective including future changes to the incorporated provisions as the changes take effect. (See Table 3-5)."

discharge, (c) the threat to public health posed by the discharge, and (d) appropriate cleanup and abatement measures. The reports will enable the Regional Board to determine the vertical and lateral extent of the discharge, ascertain if the condition of pollution poses a threat to human health in the vicinity of the Site, and provide technical information to determine what cleanup and abatement measures are necessary to bring the Site into compliance with applicable water quality objectives. Based on the nature and possible consequences of the discharges (as described in Findings No. 1 through 7, above) the burden of providing the required reports bears a reasonable relationship to the need for the reports and the benefits to be obtained from the reports.

9. **Cost Recovery:** Pursuant to California Water Code section 13304, the Regional Board is entitled to, and will seek reimbursement for, all reasonable costs actually incurred by the Regional Board to investigate unauthorized discharges of waste and to oversee cleanup of such waste, abatement of the effects thereof, or other remedial action, required by this Order.
10. **State Board Policies:** The State Board adopted Resolution No. 92-49, the *Policies and Procedures for Investigation and Cleanup and Abatement of Discharges under Water Code Section 13304*. This Resolution sets forth the policies and procedures to be used during an investigation or cleanup of a nuisance site and requires that cleanup levels be consistent with State Board Resolution No. 68-16, the *Statement of Policy with Respect to Maintaining High Quality of Waters in California*. Resolution No. 92-49 and the Basin Plan establish the cleanup levels to be achieved. Resolution No. 92-49 requires the waste to be cleaned up to background, or if that is not reasonable, to an alternative level that is the most stringent level that is economically and technologically feasible in accordance with Title 23, CCR section 2550.4. Any alternative cleanup level greater than background must (1) be consistent with the maximum benefit for the people of the state; (2) not unreasonably affect present and anticipated beneficial use of such water; and (3) not result in water quality less than that prescribed in the Basin Plan and applicable Water Quality Control Plans and Policies of the State Board.
11. **California Environmental Quality Act (CEQA) Compliance:** The issuance of this Order is an enforcement action taken by a regulatory agency and is categorically exempt from the provisions of CEQA pursuant to section 15321(a) (2), Chapter 3, Title 14 of the California Code of Regulations. This Order requires submittal of detailed work plans that address cleanup activities. The proposed activities under the work plans are not yet known, but implementation of the work plans may result in significant physical impacts to the environment that must be evaluated under CEQA. The appropriate lead agency will address the CEQA requirements prior to implementing any work plan that may have a significant impact on the environment.

- 12. Qualified Professionals:** Chevron's reliance on qualified professionals promotes proper planning, implementation, and long-term cost-effectiveness of investigation, and cleanup and abatement activities. Professionals should be qualified, licensed where applicable, and competent and proficient in the fields pertinent to the required activities. California Business and Professions Code sections 6735, 7835, and 7835.1 require that engineering and geologic evaluations and judgments be performed by or under the direction of registered professionals.
- 13. Procedural History:** The Assistant Executive Officer of the Regional Board issued Cleanup and Abatement Order R9-2009-0124 (CAO) on September 3, 2009, and issued a Revised CAO R9-2009-0124 (Revised CAO) on September 28, 2009. On October 5, 2009, the City requested a hearing on the September 3, 2009 Revised CAO before the Regional Board. On October 22, 2009, the City requested a hearing on the Revised CAO. On October 28, 2009, Chevron requested a hearing on the Revised CAO. Both the City and Chevron petitioned the State Board to review the Revised CAO, and both petitions are being held in abeyance pending the outcome of the Regional Board's hearing. A paper hearing was conducted, with a deadline of November 19, 2009, for all submissions. John H. Robertus, acting with authority delegated by David Gibson, reviewed and gave full consideration to all documents submitted by the City, Chevron, and the Regional Board. After his review, he issued a Revised CAO which makes the following amendments: (1) removes the City as a Responsible Party but finds that the City may be added as a Responsible Party if the City unreasonably denies access to Chevron; (2) changes the Replacement Water provision to allow the Regional Board to require Chevron to provide replacement water to the City; and (3) moves the 2009-2010 compliance due dates back two months.

IT IS HEREBY ORDERED that, pursuant to sections 13267 and 13304 of the Water Code, Chevron must comply with the following Directives:

- A. CLEANUP AND ABATE DISCHARGES:** Chevron shall take all corrective action necessary to cleanup and abate the effects of the discharge.
- B. INTERIM REMEDIAL ACTION:** Chevron shall implement interim remedial actions to abate or correct the actual or potential effects of the unauthorized release pursuant to CCR Title 23, Chapter 16, section 2722 (b) as necessary. Interim remedial actions may include but are not limited to activities that remove all free product (light nonaqueous phase liquid or LNAPL), remove petroleum hydrocarbon sources (e.g. soil saturated with petroleum hydrocarbons) and/or mitigate nuisance of all surface and groundwater affected by the waste discharge.

1. Interim remedial actions can occur concurrently with any phase of the site investigation or remedial action. On or before **January 29, 2010**, Chevron must begin implementation (i.e. construction) of the Interim Remedial Action described in the March 26, 2008 IRAP, provided that the water supplied to the GWRP has no detectable concentrations (using the lowest available method detection level) of fuel hydrocarbons including oxygenates such as MTBE.
2. On or before **January 29, 2010**, Chevron shall submit an operations and maintenance plan (OM Plan) to the Regional Board. The OM Plan must include:
 - a. A list of all off-site properties that Chevron must have access to in order to complete the cleanup and abatement actions. This list must include a map showing the locations of the necessary access, specifically demonstrating what access is necessary on each property. The list should show what access is necessary if Chevron uses the Dance Hall Well and must also show what access is necessary for an alternative plan that excludes the use of the City's wells.
 - b. A description of how the well head treatment system described in the IRAP will be operated and maintained.
 - c. A sampling plan to demonstrate that the water provided to the GWRP has no detectable concentrations of fuel hydrocarbons including oxygenates such as MTBE.
 - d. A monitoring plan to demonstrate the effectiveness of the IRAP.
 - e. A contingency plan in the event of "breakthrough" of fuel hydrocarbons including oxygenates such as MTBE.
3. On or before **March 30, 2010**, Chevron shall submit a technical report to the Regional Board certifying that the Interim Remedial Action is fully operational.
4. During operation of the IRAP, Chevron shall submit monthly updates reports to the Regional Board. The monthly IRAP reports shall at a minimum include:
 - a. Monthly and cumulative volumes of water extracted, treated, and delivered to the GWRP.
 - b. Monthly and cumulative hours of operation of the IRAP.
 - c. Laboratory test results of samples collected as part of the IRAP OM Plan.
 - d. Effectiveness of the IRAP in containing the MTBE plume.

- e. Any repairs and/or modifications made to the system.
- f. Records of carbon change outs.
- g. Any other information needed to demonstrate compliance with Directive B.

C. REPLACEMENT WATER: As authorized in Water Code section 13304(f), the Regional Board may require Chevron to provide replacement water to the City. Any additional costs for replacement water beyond the City's ordinary production costs for water extracted from the Dance Hall Well and treated using the GWRP will be borne solely by Chevron. Pursuant to Water Code section 13304(f) replacement water shall meet all applicable federal, state, and local drinking water standards and shall have comparable quality to that pumped by the public water system prior to the discharge. Groundwater pumped from the Dance Hall Well and treated as required by Directive B and delivered to the GWRP shall be considered replacement water.

D. GROUNDWATER MONITORING PROGRAM: Chevron shall submit the technical reports required in this Groundwater Monitoring Program (GMP) pursuant to Water Code sections 13267 and 13304.

1. Purpose: The purpose of the GMP is to provide data to answer the following questions.
 - a. To what extent is the MTBE plume migrating towards the Kinoshita, CVWD1, SJBA2, and SJBA4 municipal water supply wells?
 - b. Are interim remedial actions effective?
 - c. Has the lateral and vertical extent of each waste constituent in soil, groundwater, and soil vapor been delineated?
 - d. Is the size of the plume of each waste constituent decreasing in size and/or mass?
 - e. Has the source of each waste constituent been effectively cleaned up?
 - f. Is the selected remedial action alternative effectively removing waste constituents from the soil, groundwater, and soil vapor, and is the implemented corrective action capable of achieving the cleanup levels in the CAP?
 - g. Have the beneficial uses of the groundwater been restored, and are human health and the environment protected?

2. Monitoring: With the exception of well clusters MW-15, MW-16, and MW-17, Chevron shall monitor and sample all groundwater monitor wells on a quarterly basis. Well clusters MW-15, MW-16 and MW-17 shall be monitored and sampled monthly. Well clusters MW-15 and MW-16 shall be monitored and sampled weekly when the Dance Hall Well resumes operation. Groundwater samples shall be analyzed for total petroleum hydrocarbons quantified as gasoline and diesel using USEPA method 8015 and for **full scan of volatile organic compounds** including benzene, toluene, ethylbenzene, xylenes, MTBE, tertiary butyl alcohol (TBA), and other fuel oxygenates using USEPA method 8260b. **Additional groundwater monitoring wells may be required to meet the objectives of the groundwater monitoring program.**
3. Groundwater Monitoring Program Workplan: Chevron shall prepare and submit to the Regional Board by **January 29, 2010**, a workplan to implement the groundwater monitoring program. At a minimum the Groundwater Monitoring Program Workplan must include:
 - a. Methods to be used to monitor, purge, and sample the wells.
 - b. Request and justification for changes to the groundwater monitoring requirements specified in Directives E.1 and E.2.
 - c. A map showing the location of groundwater monitoring wells to be part of the groundwater monitoring program.
 - d. A brief workplan for the installation of additional groundwater monitoring wells needed to comply with Directive E.1.
4. Quarterly Groundwater Monitoring Reports: Chevron shall submit quarterly groundwater monitoring reports to the Regional Board according to the following schedule:

Quarter	Monitoring Period	Report Due Date
First Quarter	January, February, March	April 30
Second Quarter	April, May, June	July 30
Third Quarter	July, August, September	October 30
Fourth Quarter	October, November, December	January 30

The quarterly groundwater monitoring reports shall include:

- a. Transmittal Letter with Penalty of Perjury Statement. The transmittal letter shall discuss any violations during the reporting period and actions taken or planned to correct the problem. The letter shall be signed by the Responsible Party's principal executive officer or their duly authorized representative, and shall include a statement by the official, under penalty of perjury, that the report is true and correct to the best of the official's knowledge.
- b. Groundwater Elevations. Groundwater elevation data shall be presented in tabular format with depth to groundwater (in feet below ground surface), top of casing elevations, depths to the top of well screens, length of well screens and total depth for each well included in the monitoring program. For all wells containing floating "free petroleum product" (A.K.A. light non-aqueous phase liquid or LNAPL) include the measured thickness of LNAPL in a tabular format. A groundwater elevation map must be prepared for each monitored water-bearing zone with the groundwater flow direction and calculated hydrologic gradients(s) clearly indicated in the figures(s). A complete tabulation of historical groundwater elevations must be included in each quarterly report.
- c. Reporting Groundwater Results. All monitoring reports must, at a minimum, include:
 - i. A map showing the location of all wells and other sampling points.
 - ii. Tables of current and historic groundwater sampling data (chemical data and depth to groundwater and groundwater elevation data).
 - iii. Isoconcentration map(s) for constituents of concern (COCs) for each monitored water-bearing zone, as appropriate.
 - iv. Time versus concentration plots that also show groundwater elevations for constituents of concern for appropriate wells.
 - v. A site plot plan which clearly illustrates the locations of monitoring wells, former/current UST systems (and product piping) and buildings located on the property and immediately adjacent to the property lines of the facility.
 - vi. A map presenting the most recent concentrations of total petroleum hydrocarbons and volatile aromatic hydrocarbons (e.g. benzene, toluene, ethylbenzene, total xylenes, MTBE, TBA and other fuel oxygenates).

- vii. Technical interpretations of the groundwater data, and describe any significant increases in pollutant concentrations since the last report, any measures proposed to address the increases, any changes to the site conceptual model, and any conclusions and recommendations for future action with each report.
 - viii. A description of the analytical methods used, detection limits obtained for each reported constituent, and a summary of quality assurance/quality control (QA/QC) data.
 - ix. A data validation summary which evaluates the sampling methods, laboratory data, and laboratory QA/QC data to determine whether or not there were deviations in the sampling method or if there are any QA/QC items which did not meet the appropriate standards, and to what degree these noted excursions affect the monitoring data.
 - x. The report must indicate sample collection protocol(s), describe how investigation derived wastes are managed at the facility, and include documentation of proper disposal of contaminated well purge water and/or soil cuttings removed from the facility.
 - d. Remediation. If applicable, the report must include soil vapor or groundwater extraction results in tabular form, for each extraction well and for the Site as a whole. The report must also include contaminant removal results, from all extraction wells and from other cleanup and abatement systems, expressed in units of pounds per month and quarter, and cumulative pounds since initiation of the remedial action.
 - e. Status Report. The quarterly report must describe relevant work completed during the reporting period (e.g. Site investigation, interim remedial measures) and work planned for the following quarter.
5. Record Keeping: Chevron, or its agent, must retain data generated for the above reports, including laboratory results and QA/QC data, for a minimum of six years after origination and must make them available to the Regional Board upon request.
6. Groundwater Monitoring Program Revisions: Revisions to the GMP may be ordered by the Regional Board. Prior to making GMP revisions, the Regional Board will consider the burden, including costs, of the groundwater monitoring reports relative to the benefits to be obtained from these reports.

E. SITE ASSESSMENT REPORT: Chevron shall prepare and submit a Site Assessment Report (Report) describing the results of the site investigation. The

Report is due no later than 5:00 p.m. on **June 30, 2010**, and shall contain the following information:

1. **Source Characterization:** The report shall contain the results of an investigation of all potential sources of waste constituent discharges to soil and groundwater including, but not limited to, historical records of operations, site reconnaissance, and previous sampling studies. The information in the technical report shall provide an adequate basis for determining subsequent effective cleanup and abatement actions. All sources of waste constituent releases shall be located on a site map at a scale of 1 inch = 200 feet or larger, with an appropriate contour interval to depict site topography.
2. **Geologic Characterization:** The report shall contain an accurate characterization of the subsurface geology, the hydrogeologic characteristics, and all preferential pathways that may affect groundwater flow and contaminant migration.
3. **Groundwater Flow Characterization:** The report shall describe the rate(s) and direction(s) of local groundwater flow, in both the horizontal and vertical dimension for all water-bearing units potentially affected by the waste constituent(s) from the facility.
4. **Extent of Waste Constituent Characterization:** The report shall adequately characterize the extent (both laterally and vertically) of each waste constituent in soil and groundwater to the background⁹ concentration for that waste constituent, and characterize any pollution that has migrated off-property.
5. **Human Health and Ecological Risk Assessment:** The report shall include a human health and ecological risk assessment for every complete exposure pathway identified in the Site Conceptual Model (SCM). The human health and ecological risk assessments should follow USEPA and the California Environmental Protection Agency guidance.
6. **Groundwater Monitoring Wells:** The report shall describe the location of existing monitoring wells, and the proposed location of additional monitoring wells, needed to characterize the types of waste constituents present, the concentrations of waste constituents, and their lateral and vertical extent in groundwater. The report shall include locations of proposed wells located between the downgradient extent of the dissolved plume and downgradient groundwater production wells to serve as an "early warning" should the plume migrate towards these wells.

⁹ "Background" means the concentrations or measures of constituents or indicator parameters in water or soil that have not been affected by waste constituents from the site. For volatile organic compounds, oxygenates, and gasoline constituents the background concentration is zero.

7. **Field Methodologies:** The report shall describe the field methodologies used for drilling, soil sampling, groundwater sampling, well and piezometer construction, geophysical surveys, and other activities. Selected methods for purging and sampling monitoring wells must be capable of providing representative samples of groundwater for detecting all of the waste constituents.
8. **Chemical Analyses:** The report shall describe the laboratory analytical methods and protocols used for each environmental medium including soil, soil vapor, and water. The suite of chemical analyses, methods and protocols must be adequate to quantitatively identify and characterize the full range of site-specific waste constituents.
9. **Sample Locations and Number:** The report shall contain the locations, type, and number of samples identified and shown on a site map and cross sections. The number of samples and suite of chemical analyses must be sufficient to identify the nature of waste constituent(s) and their sources, to define the distribution of waste constituents in the subsurface, to provide data for evaluation of fate and transport of pollutants, risk assessment, remedy selection, and remedial design. In addition, samples shall be collected to evaluate physical properties of soils and aquifer materials. All monitoring data shall be presented in tabular format including the sample result, sample medium, location, depth, sampling method, analyses and rationale for the method.
10. **Updated Site Conceptual Model:** The report shall contain an updated SCM that updates the initial SCM using all data collected at the facility. The updated SCM must include data, interpretations, and a discussion of the level of uncertainty of conclusions.
11. **Groundwater Monitoring Program:** The report shall contain a proposed revised GMP. The objective of the GMP is to determine the changes in the nature and extent of the dissolved petroleum hydrocarbon plume. At a minimum the GMP shall include the rationale for the proposed sampling program, a narrative of the proposed sampling locations, sampling frequency, and laboratory test methods, and a map showing the location of the proposed sampling locations.

F. CORRECTIVE ACTION PLAN (CAP): Chevron shall prepare and submit to the Regional Board by **June 30, 2010**, a CAP that satisfies the provisions of CCR Title 23, Chapter 16 section 2725. The CAP must address cleanup of soil and groundwater at the facility and all groundwater impacted by the discharge(s) from the facility, and must contain all the elements specified in CCR Title 23, section 2725 including:

1. **Assessment of Impacts:** The CAP shall include an assessment of impacts in accordance with section 2725 (e), which includes but is not limited to:

- a. The physical and chemical characteristics of the hazardous substance or its constituents, including their toxicity, persistence and potential for migration in water, soil and air.
 - b. The hydrogeologic characteristics of the facility and the surrounding area where the unauthorized release has migrated or may migrate.
 - c. The proximity and quality of nearby surface water or groundwater, and the current and potential beneficial uses of these waters.
 - d. The potential effects of residual contamination on nearby surface water and groundwater.
2. Feasibility Study: The CAP shall include a feasibility study to evaluate alternatives for cleanup of soil and groundwater. The evaluation shall be consistent with the requirements of CCR Title 23, Division 3, Chapter 16, section 2725(f) and include the following elements:
- a. An evaluation of the effectiveness, feasibility, and cost of at least two alternatives to restore or protect the beneficial uses of groundwater.
 - b. An evaluation of methods to control the spread of the dissolved contaminant plume off the property.
 - c. A comprehensive description of the cleanup and abatement activities associated with each recommended alternative.
 - d. A proposed action schedule, including interim milestone dates, for completion of each recommended alternative.
3. Cleanup Levels: The CAP shall evaluate applicable cleanup levels in accordance with the requirements of section 2725(g) and shall comply with the requirements found in section 2721(b), State Board Resolution No. 92-49, and Finding 10 of this Order.
- a. Groundwater Cleanup Levels. Chevron shall cleanup and abate the effects of the discharge in a manner that promotes the attainment of either background groundwater quality or the best water quality which is reasonably attainable if background levels of water quality cannot be restored, considering all demands being made and to be made on those waters and the total values involved, beneficial and detrimental, economic and social, tangible and intangible. Any alternative cleanup levels less stringent than background groundwater quality shall:

- i. Be consistent with maximum benefit to the people of the state;
 - ii. Not unreasonably affect present and anticipated beneficial use of such water; and
 - iii. Not result in water quality less than that prescribed in the Water Quality Control Plans and Policies adopted by the State Board and Regional Board.
- b. **Soil Cleanup Levels.** Residual concentrations of fuel constituents in soils must meet all the following criteria: 1) be low enough so that leachable contaminants will not cause the groundwater cleanup levels to be exceeded at/near the facility; and 2) be protective of human health and the environment. Chevron shall propose a range of site-specific soil cleanup levels based upon a technical evaluation of risks from residual soil contaminants and analytical results from contaminant leachability tests performed on an adequate number of significantly contaminated soils samples collected from the facility.
4. **Corrective Action Evaluation Monitoring Program:** The CAP shall include a corrective action evaluation monitoring program (EMP). The objective of the EMP is to determine the effectiveness of the corrective action and shall be used to make adjustments to the implementation of the CAP. At a minimum the EMP shall include the rationale for the proposed sampling program, a narrative of the proposed sampling locations, sampling frequency, and laboratory test methods, and a map showing the location of the proposed sampling locations.

G. IMPLEMENTATION OF CAP: Chevron shall implement the CAP in accordance with the action schedule in the approved CAP. Chevron shall begin implementation of the CAP no later than **September 30, 2010**. Chevron shall propose a method(s) and schedule for the monitoring and reporting of progress of remediation at the facility. These results should be used by Chevron to evaluate the effectiveness of the approved corrective action alternative implemented by Chevron to remediate the soil and groundwater contamination from the unauthorized release at the facility. The results and the technical evaluation must be reported to the Regional Board Executive Officer for review and comment.

No later than **December 31, 2010**, Chevron shall submit a technical report to the Regional Board certifying that the preferred remedial action alternative(s) is fully operational and evaluating the effectiveness of the CAP.

H. COMPLETION OF SOURCE AREA CLEANUP: The source area is defined as the facility and immediately adjacent area where petroleum hydrocarbons in soil and groundwater are the source of continued discharges of petroleum hydrocarbon

wastes to groundwater. Soil and groundwater cleanup goals in the source area shall be achieved no later than **January 5, 2015**.

No later than 5:00 P.M. on **January 5, 2015**, Chevron shall submit a workplan to the Regional Board to conduct confirmation sampling to demonstrate that soil and groundwater cleanup goals in the source area have been met. No later than 5:00 P.M. on **June 30, 2015**, Chevron shall submit a technical report to the Regional Board presenting the results of soil and groundwater confirmation sampling and certifying that cleanup levels in the source area have been achieved.

I. COMPLETION OF NON-SOURCE AREA CLEANUP: Soil and groundwater cleanup goals outside of the source area shall be achieved no later than **January 6, 2020**.

J. VERIFICATION MONITORING: No later than **April 30, 2020**, Chevron shall submit a workplan to the Regional Board to implement a verification monitoring program that includes a schedule for submitting monitoring reports.¹⁰ Chevron shall conduct verification monitoring in conformance with the provisions of section 2727 of CCR Title 23, Chapter 16. Chevron shall begin implementation of the verification monitoring program no later than **June 30, 2020**. No later than **July 30, 2021**, Chevron shall submit a technical report presenting the results of the groundwater cleanup verification monitoring program which certifies that groundwater cleanup levels have been achieved.

K. COMPLIANCE DATES: The following is a summary of the due dates for activities presented in the preceding directives.

<i>Directive</i>	<i>Activity</i>	<i>Due Date</i>
B	Interim Remedial Action Implementation	January 29, 2010
	IRAP Operations and Maintenance Plan	January 29, 2010
	Interim Remedial Action Certification Report	March 30, 2010
D	Groundwater Monitoring Program Workplan	January 29, 2010
E	Site Assessment Report	June 30, 2010
F	Corrective Action Plan	June 30, 2010
G	Corrective Action Plan Implementation	September 30, 2010
	Corrective Action Certification Report	December 31, 2010
H	Completion of Source Area Cleanup	January 5, 2015

¹⁰ Verification groundwater monitoring shall include both source area and non-source area.

Directive	Activity	Due Date
	Source Area Cleanup Confirmation Workplan	January 5, 2015
	Source Area Cleanup Certification Report	June 30, 2015
I	Completion of Non-Source Area Cleanup	January 6, 2020
J	Groundwater Verification Monitoring Workplan	April 30, 2020
	Groundwater Cleanup Verification Report	July 30, 2021

L. DOCUMENT SUBMITTALS:

1. Transmittal Letter: A transmittal letter shall be included with all Reports submitted in compliance with this Order and shall include the following:
 - a. Content. The Transmittal Letter shall include a brief discussion of the findings, conclusion(s), and recommendation(s) presented in the Report.
 - b. Certification Statement. The person signing the Transmittal Letter shall make the following certification:

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."
2. Signatory Requirements: All reports required by this Order and other information required by the Regional Board shall be signed:
 - a. By a person certified as follows:
 - i. For a corporation: A principal executive officer, at least a vice president of the corporation, or duly authorized representative.
 - ii. For a partnership or sole proprietorship: A general manager or the proprietor, respectively, or duly authorized representative.

- iii. For a municipality, state, federal, or other public agency: Either a principle executive officer, ranking elected official, or duly authorized representative.
-
- b. An individual is a duly authorized representative only if:
 - i. The authorization is made in writing by a person described in paragraph 2.a of this section.
 - ii. The authorization specifies either an individual or position having responsibility for the overall operation of the regulated facility or activity.
 - iii. The written authorization is submitted to the Regional Board prior to submission of the Report.
 3. Chevron shall submit both one paper and one electronic, searchable PDF copy of all documents required under this Order to:

Executive Officer
California Regional Water Quality Control Board, San Diego Region
9174 Sky Park Court, Suite 100
San Diego, California 92123-4353
Attn: Barry Pulver, Groundwater Basins Branch

All correspondence and documents submitted to the Regional Board shall include the following Geotracker Site ID in the header or subject line:

T0605902379:bpulver

M. ELECTRONIC DATA SUBMITTALS: The State's Electronic Reporting Regulations (Chapter 30, Division 3 of Title 23 & and Division 3 of Title 27, CCR) require electronic submission of any report or data required by a regulatory agency from a cleanup site after July 1, 2005. All information submitted to the Regional Board in compliance with this Order is required to be submitted electronically via the Internet into the Geotracker database <http://geotracker.waterboards.ca.gov/> (Geotracker Site ID. **T0605902379**). The electronic data shall be uploaded on or prior to the regulatory due dates set forth in the Order or addenda thereto. To comply with these requirements, Chevron shall upload to the Geotracker database the following minimum information.

1. Laboratory Analytical Data: Analytical data (including geochemical data) for all soil, vapor, and water samples in Electronic Data File (EDF) format. Water, soil, and vapor data include analytical results of samples collected from: monitoring wells, boreholes, gas and vapor wells or other collection devices, surface water, groundwater, piezometers, stockpiles, and drinking water wells.

2. **Locational Data:** The latitude and longitude of any permanent monitor well for which data is reported in EDF format, accurate to within 1 meter and referenced to a minimum of two reference points from the California Spatial Reference System (CSRS-H), if available.
3. **Monitoring Well Elevation Data:** The surveyed elevation relative to a geodetic datum of any permanent monitor well. Elevation measurements to the top of groundwater well casings for all groundwater monitoring wells.
4. **Depth-to-Water Data:** The depth-to-water in monitoring wells even if groundwater samples are not actually collected during the sampling event.
5. **Monitoring Well Screen Intervals:** The depth to the top of the screened interval and the length of screened interval for any permanent monitoring well.
6. **Site Map:** Site map or maps which display discharge locations,¹¹ streets bordering the facility, and sampling locations for all soil, water, and vapor samples. The site map is a stand-alone document that may be submitted in various electronic formats.¹² A site map must also be uploaded to show the maximum extent of any waste constituent in groundwater. An updated site map may be submitted at any time.
7. **Boring logs:** Boring logs (in searchable PDF format) prepared by an appropriately licensed professional.
8. **Electronic Report:** A complete copy (in searchable PDF format) of all workplans, assessment, cleanup, and monitoring reports including the signed transmittal letters, professional certifications, and all data presented in the reports.

N. VIOLATION REPORTS: If Chevron violates any requirement of this Order, then Chevron must notify the Regional Board office by telephone as soon as practicable once Chevron has knowledge of the violation. Regional Board staff may, depending on violation severity, require Chevron to submit a separate technical report on the violation within five working days of telephone notification.

O. OTHER REPORTS: Chevron must notify the Regional Board in writing prior to any facility activities, such as construction or removal of USTs, which have the potential to cause further migration of contaminants or which would provide new opportunities for Site investigation.

¹¹ Former tank(s), product and vapor piping, dispenser locations, or sump locations, and unauthorized discharge or spill areas.

¹² Formats include .gif, .jpeg, .jpg, .tiff, .tif, .pdf

PROVISIONS

- A. NO POLLUTION, CONTAMINATION OR NUISANCE:** The storage, handling, treatment, or disposal of soil containing petroleum hydrocarbon waste or polluted groundwater must not create conditions of nuisance as defined in Water Code section 13050(m). Chevron must properly manage, treat and dispose of wastes and polluted groundwater in accordance with applicable federal, state and local regulations.
- B. GOOD OPERATION AND MAINTENANCE:** Chevron must maintain in good working order and operate as efficiently as possible any monitoring system, Site or control system installed to achieve compliance with the requirements of this Order.
- C. CONTRACTOR/CONSULTANT QUALIFICATIONS:** All reports, plans and documents required under this Order shall be prepared by or under the direction of appropriately qualified professionals. A statement of qualifications and license numbers, if applicable, of the responsible lead professional and all professionals making significant and/or substantive contributions shall be included in the report submitted by Chevron. The lead professional performing engineering and geologic evaluations and judgments shall sign and affix their professional geologist or civil engineering registration stamp to all technical reports, plans or documents submitted to the Regional Board.
- D. LABORATORY QUALIFICATIONS:** Unless otherwise permitted by the Regional Board, all analyses shall be conducted at a laboratory certified for such analyses by the California Department of Health Services. Chevron must use a laboratory capable of producing and providing quality assurance/quality control (QA/QC) records for Regional Board review. The director of the laboratory whose name appears on the certification shall supervise all analytical work in his/her laboratory and shall sign all reports submitted to the Regional Board.
- E. LABORATORY ANALYTICAL REPORTS:** Any report presenting new analytical data is required to include the complete Laboratory Analytical Report(s). The Laboratory Analytical Report(s) must be signed by the laboratory director and contain:
1. A complete sample analytical report.
 2. A complete laboratory quality assurance/quality control (QA/QC) report.
 3. A discussion of the sample and QA/QC data.
 4. A transmittal letter that shall indicate whether or not all the analytical work was supervised by the director of the laboratory, and contain the following

statement, "All analyses were conducted at a laboratory certified for such analyses by the California Department of Health Services in accordance with current USEPA procedures."

- F. ANALYTICAL METHODS:** Specific methods of analysis must be identified in monitoring program reports. If Chevron proposes to use methods or test procedures other than those included in the most current version of *"Test Methods for Evaluations Solid Waste, Physical/Chemical Methods, SW-846"* (USEPA) or 40 CFR 136, *"Guidelines Establishing Test Procedures for the Analysis of Pollutants; Procedures for Detection and Quantification,"* the exact methodology must be submitted for review and must be approved by the Regional Board prior to use.
- G. REPORTING OF CHANGED OWNER OR OPERATOR:** Chevron must notify the Regional Board of any changes in Site occupancy or ownership associated with the property described in this Order.
- H. PENALTY OF PERJURY STATEMENT:** All reports must be signed by Chevron's principal executive officer or their duly authorized representative, and must include a statement by the official, under penalty of perjury, that the report is true and correct to the best of the official's knowledge.
- I. REGULATIONS:** All corrective actions must be in accordance with the provisions of CCR Title 23, Chapter 16; the Cleanup and Abatement Policy in the Water Quality Control Plan for the San Diego Basin (9); and State Board Resolution No. 92-49.

NOTIFICATIONS

- A. COST RECOVERY:** Pursuant to Water Code section 13304(c), the Regional Board is entitled to, and will seek reimbursement for, all reasonable costs actually incurred by the Regional Board to investigate unauthorized discharges of waste and to oversee cleanup of such waste, abatement of the effects thereof, or other remedial action, required by the Order.
- B. ENFORCEMENT NOTIFICATION:** Failure to comply with requirements of this Order may subject the Responsible Parties to enforcement action, including but not limited to: imposition of administrative civil liability, pursuant to Water Code sections 13268 and 13350, in an amount not to exceed \$5,000 for each day in which the violation occurs under Water Code sections 13304 or 13350 or referral to the Attorney General for injunctive relief or civil or criminal liability.

C. REQUESTING ADMINISTRATIVE REVIEW BY THE STATE BOARD: Any person affected by this action of the Regional Board may petition the State Board to review the action in accordance with section 13320 of the Water Code and CCR Title 23 section 2050. The petition must be received by the State Board (Office of Chief Counsel, P.O. Box 100, Sacramento, California 95812) within 30 days of the date of this Order. Copies of the law and regulations applicable to filing petitions will be provided upon request.



JOHN H. ROBERTUS

12/23/09
DATE

BINGHAM McCUTCHEN LLP
JILL C. TERAOKA (SBN 155800)
MELANIE A. TORY (SBN 252387)
355 South Grand Avenue, Suite 4400
Los Angeles, CA 90071-3106
Telephone: 213.680.6400
Facsimile: 213.680.6499

ATTORNEYS FOR PETITIONER
CHEVRON U.S.A. INC.

STATE OF CALIFORNIA

STATE WATER RESOURCES CONTROL BOARD

In Re:

SAN DIEGO REGIONAL WATER
QUALITY CONTROL BOARD
REVISED CLEANUP AND
ABATEMENT ORDER REGARDING
CHEVRON SERVICE STATION NO.
9-3417, 32001 CAMINO CAPISTRANO,
SAN JUAN CAPISTRANO,
CALIFORNIA

No.

EXHIBITS TO CHEVRON U.S.A. INC.'S
JANUARY 22, 2010 PETITION FOR
REVIEW OF REVISED CLEANUP AND
ABATEMENT ORDER NO. R9-2009-0124;
AND REQUEST FOR STAY

[T0605902379:bpulver]

Pursuant to California Code of Regulations, Title 23, section 2050.6, Chevron U.S.A. Inc. ("Chevron") respectfully submits the exhibits referenced below in support of its Petition for Review ("Petition") of Revised Cleanup and Abatement Order No. R9-2009-0124, issued on December 23, 2009 (the "Revised CAO"), in relation to the property located at 32001 Camino Capistrano, in San Juan Capistrano, California (the "Site"), and Chevron's Request for Stay ("Request"). These exhibits supplement the evidence Chevron previously submitted to the State Water Resources Control Board ("State Board") in support of its Petition for Review of the CAO issued on September 28, 2009 (numbered as Exhibits 1 through 34), as well as the evidence it previously submitted to the Regional Water Quality Control Board, San Diego Region ("Regional Board") in Opposition to the City of San Juan Capistrano's ("City's") Request for an

A/73274701.1

Evidentiary Hearing (numbered as Exhibits 35 through 82). Each exhibit, and the reasons for its consideration, are set forth below.

EXHIBIT NO. 83	REASONS FOR CONSIDERATION
Site Conceptual Model, Site Characterization Report, and First Quarter 2003 Groundwater Monitoring Report, Chevron Service Station No. 9-3417, 32001 Camino Capistrano, San Juan Capistrano, California, [Orange County Health Care Agency "OCHCA"] Case No. 89UT27, dated March 24, 2003	This report explains the investigation and remediation activities undertaken by Chevron between 1998 and 2003. Further, it affirms the fact that the MTBE plume emanating from the Site was stable, and that MTBE concentrations were decreasing prior to the City's installation of the Groundwater Recovery Plant ("GWRP") wells. Since this report was submitted to the OCHCA, it is already part of the administrative record for the Site.
EXHIBIT NO. 84	REASONS FOR CONSIDERATION
1st Quarter 2004 Groundwater Monitoring and Progress Report, dated February 20, 2004	This report states that data collected during the first quarter of 2004 confirmed that the MTBE plume emanating from the Site was stable, and that MTBE concentrations were decreasing in the downgradient groundwater monitoring wells. Since this report was submitted to the OCHCA, it is already part of the administrative record for the Site.
EXHIBIT NO. 85	REASONS FOR CONSIDERATION
2nd Quarter 2005 Site Status Report, dated July 25, 2005	This report shows that data collected during the second quarter of 2005 indicated that the MTBE plume had begun to migrate. Since this report was submitted to the OCHCA, it is already part of the administrative record for the Site.

1	EXHIBIT NO. 86	REASONS FOR CONSIDERATION
2	Investigation Work Plan, dated August 9, 2005	This report explains the proactive steps taken
3		by Chevron to evaluate the MTBE plume.
4		Since this report was submitted to the OCHCA,
5		it is already part of the administrative record for
6		the Site.
7	EXHIBIT NO. 87	REASONS FOR CONSIDERATION
8	E-mail correspondence between Natasha Molla,	This e-mail correspondence establishes that a
9	Chevron's Team Lead for Retail and C&I-	few weeks after the City stated that its receipt
10	Southwest, Jack Fraim, Chevron's consultant,	of the modeling files was the " <u>only</u> " remaining
11	and John O'Donnell, the City's Utilities	obstacle to Chevron gaining access to the City's
12	Director, re the Weekly Summary Report for	property, the City changed its position and
13	the Week Ending January 30, 2008 [sic], dated	instead asserted that "[t]he key issue for the
14	February 3-4, 2009	City is the level of MtBE's [sic] in our well
15		water." In this way, this e-mail correspondence
16		helps demonstrate that the City has continually
17		changed its position in dealing with Chevron
18		and unreasonably refused Chevron access to its
19		property.
20	EXHIBIT NO. 88	REASONS FOR CONSIDERATION
21	E-mail correspondence from Ms. Molla to Mr.	These documents demonstrate Chevron's
22	West relating to the execution of the attached	continued efforts to seek access to the City's
23	Interim Remedial Action Access Agreement,	property. Further, they demonstrate that the
24	dated December 23, 2009	terms of access proposed by Chevron (namely,
25		the scope of the indemnity and release
26		provisions) are by no means overbroad or in
27		any way onerous. For this reason, these
28		documents support Chevron's argument that the
		City continues to unreasonably refuse Chevron
		access to its property for the purpose of

1		implementing the Interim Remedial Action
2		Plan ("IRAP").
3	EXHIBIT NO. 89	REASONS FOR CONSIDERATION
4	Letter from Ms. Molla to Joe Tait, the City's	This letter documents Chevron's efforts to
5	Interim Utilities Director, dated	address the City's technical concerns and its
6	December 1, 2009, re Chevron's Revised	demand that the design flow rate for the Dance
7	Preliminary Design Report ("Revised PDR").	Hall Well be increased from 900 gallons per
8		minute ("gpm") to 1,000 gpm. Moreover, this
9		letter evidences Chevron's continued effort to
10	EXHIBIT NO. 90	REASONS FOR CONSIDERATION
11	Capistrano Well Water Quality Analysis	This report states that the Dance Hall Well is
12		capable of producing only 1,000 gpm. This is
13		significant in that it undercuts the City's claim
14		that the Dance Hall Well can and should be
15		pumped at 1,250 gpm, and thus shows that the
16		City's new demand that Chevron agree to a
17		1,250 gpm design flow rate is part of the City's
18		effort to impede Chevron's implementation of
19	EXHIBIT NO. 91	REASONS FOR CONSIDERATION
20	Driller's Well Completion Report for the Dance	This report estimates the maximum long-term
21	Hall Well, dated January 14, 2004	pumping rate of the Dance Hall Well at 1,000
22		gpm. Accordingly, like the Capistrano Well
23		Water Quality Analysis, this report undercuts
24		the City's claim that the Dance Hall Well can
25		and should be pumped at 1,250 gpm, and thus
26		shows that the City's new demand that Chevron
27		agree to a 1,250 gpm design flow rate is part of
28		the City's effort to impede Chevron's
		implementation of the IRAP.

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EXHIBIT NO. 92	REASONS FOR CONSIDERATION
<p data-bbox="244 258 809 457">“Curtain Rises on 2010, Officials vow year ahead will be award-winning,” by Jonathan Volzke, <u>The Capistrano Dispatch</u> (Jan. 8-21, 2010)</p>	<p data-bbox="893 254 1509 1003">This article – published shortly after the City was removed as a Responsible Party from the December 23, 2009 Revised CAO – indicates that the City is unlikely to cooperate with Chevron in implementing the IRAP, absent a legal obligation to do so. City Manager Mr. Tait is quoted as stating that the removal of the City as a Responsible Party places remediation of the MTBE plume “squarely on Chevron’s shoulders.” For this reason, this article supports Chevron’s request for permission to implement alternative remedial action, as well as its request for the City to be named a Responsible Party.</p>
EXHIBIT NO. 93	REASONS FOR CONSIDERATION
<p data-bbox="244 1092 860 1291">Bi-weekly Summary Report for the Period Ending December 18, 2009, sent from Mr. Fraim to Barry Pulver of the Regional Board on December 23, 2009</p>	<p data-bbox="893 1087 1509 1617">This report documents the fact that the City has directed the South Orange County Wastewater Authority (“SOCWA”) to place a “hold” on Chevron’s permit application to discharge water from a groundwater pump-and-treat system to SOCWA’s sewer system because of “litigation with Chevron.” As such, this report further evidences the City’s obstruction of Chevron’s efforts to remediate the MTBE plume.</p>
EXHIBIT NO. 94	REASONS FOR CONSIDERATION
<p data-bbox="244 1705 865 1852">Letter from Ms. Molla to Mr. Pulver regarding the deadline for initiating implementation of the IRAP, dated January 5, 2010</p>	<p data-bbox="893 1701 1476 1900">In this letter, Chevron explains that it will be unable to begin implement the IRAP by the January 29, 2010 deadline because the City continues to unreasonably refuse Chevron</p>

1		access to its property, and because such
2		implementation will require at least 7 months
3		from the date of access.
4	EXHIBIT NO. 95	REASONS FOR CONSIDERATION
5	Letter from the State Board to Steven Hoch re	In this letter, the State Board explains that
6	the Olin Corporation site located at 425	California Water Code section 13360 prohibits
7	Tennant Avenue, in Morgan Hill, California,	regional boards from specifying a "particular
8	dated June 29, 2007	manner in which compliance may be had" with
9		a CAO. This statement supports Chevron's
10		request to implement alternative remedial
11	EXHIBIT NO. 96	REASONS FOR CONSIDERATION
12	E-mail correspondence between Ms. Molla and	This correspondence shows Chevron's efforts
13	Mr. Tait re the agenda for the parties'	to obtain the City's comments on Chevron's
14	December 21, 2009 meeting, dated	Revised PDR and to coordinate review of the
15	December 18, 2009	80% design with the City. Thus, it supports
16		Chevron's argument that, despite Chevron's
17		attempts to work with the City, the City
18		continues to impede Chevron's remediation
19	EXHIBIT NO. 97	REASONS FOR CONSIDERATION
20	Minutes from the December 21, 2009 technical	These minutes demonstrate the City's most
21	meeting attended by Chevron, the City, and the	recent change in position that it now demands a
22	Regional Board, prepared by Mr. Pulver and	flow rate of 1,250 gpm instead of the
23	revised by Ms. Molla; cover e-mail transmitting	previously agreed 1,000 gpm. Further, they
24	same	confirm the fact that the City has instructed
25		SOCWA to place Chevron's permit application
26		to discharge water from a pump-and-treat
27		system on "hold." Accordingly, the minutes
28		show that the City is unreasonably impeding
		Chevron's remediation efforts.

1	EXHIBIT NO. 98	REASONS FOR CONSIDERATION
2	Letter from Ms. Molla to Mr. Tait re resolution	This letter reflects Chevron's effort to confirm
3	of the City's technical concerns regarding	the terms of the agreement reached by the
4	Chevron's design of the Dance Hall wellhead	parties at the October 29, 2009 technical
5	treatment system, dated November 20, 2009	meeting, in light of a conversation between the
6		City and Chevron's counsel on
7		November 4, 2009. During that conversation,
8		the City's counsel stated that the wellhead
9		treatment system was "ridiculous," "non-
10		functional," and needed to be completely re-
11		designed. This about-face supports Chevron's
12		argument that the City continues to renege on
13		its prior agreements and to create technical
14		obstacles as a means of thwarting Chevron's
15		efforts to implement the IRAP.
16	EXHIBIT NO. 99	REASONS FOR CONSIDERATION
17	Minutes prepared by Ms. Molla for the	These minutes document the City's continued
18	January 11, 2010 technical meeting attended by	failure to provide comments on Chevron's
19	Chevron and the City	Revised PDR, despite repeated requests by both
20		the Regional Board and Chevron for such
21		comments. Thus, they support Chevron's
22		argument that the City is unreasonably
23		impeding Chevron's remediation efforts.
24	EXHIBIT NO. 100	REASONS FOR CONSIDERATION
25	Letter from Ms. Molla to Mr. Tait re response	This letter confirms that Chevron revised its
26	to the City's November 25, 2009 letter, dated	PDR to accommodate the City's
27	December 18, 2009	October 29, 2009 demand that the flow rate be
28		increased from 900 gpm to 1,000 gpm. The
		letter also points out that the City has provided
		no technical explanation or documentation to
		support its demand that Chevron's PDR be

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	revised yet again to accommodate a flow rate of 1,250 gpm. Accordingly, this letter supports Chevron's argument that the City is creating technical obstacles to block Chevron's efforts to implement the IRAP.
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EXHIBIT NO. 101	REASONS FOR CONSIDERATION
Declaration of Ms. Molla in Support of Chevron's Petition and Request	Ms. Molla's declaration sets forth facts and information pertinent to the City's Petition and Request.

DATED: January 22, 2010

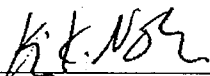
BINGHAM MCCUTCHEN LLP

By: Jill C. Teraoka
Jill C. Teraoka
Attorneys for
Chevron U.S.A. Inc.

**Site Conceptual Model
Site Characterization Report,
Site Assessment Report, and
First Quarter 2003 Groundwater Monitoring Report
Chevron Service Station No. 9-3417
32001 Camino Capistrano
San Juan Capistrano, California
OCHCA Case No. 89UT27**

Prepared for
Chevron Environmental Management Company
145 South State College Boulevard, Suite 400
Brea, California 92822

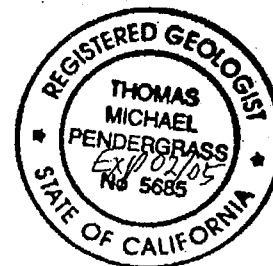
SAIC Project No. 06-6041-00-2973-283



Kimberly K. Noble
Project Geologist



T. Michael Pendergrass, R.G. 5685
Principal Geologist



SAIC **Science Applications
International Corporation**
An Employee-Owned Company

March 24, 2003

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APPENDICES

Appendix A	Groundwater Monitoring Well And Soil Boring Logs
Appendix B	SJBA 1997 Well Survey Data
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Appendix D	Historical Vapor Extraction Data
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DISTRIBUTION

EXECUTIVE SUMMARY

This report presents an Updated Site Conceptual Model for active Chevron Service Station No. 9-3417 located on the southwest corner at the intersection of Camino Capistrano and Del Obispo in San Juan Capistrano, California. The station began operations in 1972 and currently maintains three double-walled fiberglass gasoline USTs, one 250 gallon used-oil AST, four dispenser islands, and a station building. Operations are anticipated to cease at the station in the future. Commercial and retail operations surround the site. Trabuco Creek and San Juan Creek are located approximately 90 feet east and 1,600 feet southeast of the site, respectively.

The site is at an elevation of approximately 90 feet above MSL and is located within the floodplain of Trabuco Creek in the northern Peninsular Range of southern Orange County California. Near the station, the floodplain extends approximately two miles across and is bound by the San Joaquin Hills approximately 1.25 miles to the west and the foothills of the Santa Ana Mountains 0.75 mile to the east of the site. The site is located within the lower Trabuco Creek Division of the San Juan Groundwater Basin, defined as the area downgradient of the confluence of Oso and Trabuco Creeks. The San Juan Groundwater basin underlies the San Juan Valley and several tributary valleys in southern Orange County. The primary water-bearing layer with the basin is Quaternary alluvium.

Previous subsurface investigations indicate the site is underlain with fine-grained sediments to approximately 15 feet bgs followed by coarser-grained sediments to a maximum explored depth of approximately 35 feet bgs. Groundwater is typically encountered at approximately 14 feet bgs and appears to flow to the south at an approximate gradient of 0.007 ft/ft.

Environmental investigations were initiated at the site in September 1988 when a gasoline release was reported. Since October 1988, eleven groundwater monitoring wells have been installed onsite and offsite; however, only nine groundwater monitoring wells are currently active. There have been 23 additional soil borings drilled at the site, 119 soil samples collected and laboratory analyzed, 320.3 cubic yards of soil containing petroleum hydrocarbons removed during excavation activities of the UST basin and product piping in 1990 and dispenser island containment upgrades in 2001, and 960 pounds of petroleum hydrocarbons destroyed during vapor extraction system operations in 1996.

Based on site assessment activities, petroleum hydrocarbons in soil have been detected in samples that exceed the APSR for toluene, ethylbenzene, and total xylenes collected within the UST basin, north-northeast of the UST basin beneath the product piping, and beneath the southeastern dispenser islands. Petroleum hydrocarbon concentrations in groundwater appear to be adequately assessed in the northern, eastern, and western portions of the site. Benzene concentrations are primarily detected in MW-8 and remain onsite. MtBE concentrations have migrated to the south, downgradient, and offsite. Monitoring data from 2002 indicate that concentrations are stabilizing and decreasing. The site may be considered assessed to the south if these decreasing trends continue in CMW-9, CMW-11, and AMW-1.

The environmental exposure route of concern appears to be for residual petroleum hydrocarbons to migrate to a water supply well. Based on current site conditions, it does not appear likely that residual petroleum hydrocarbons would migrate upgradient to any of the groundwater supply wells located north of the site.

Based on previous investigations, the site appears to be adequately assessed. Continued quarterly groundwater monitoring is recommended for the site. Following two years of consecutive groundwater monitoring, the site should be reevaluate for case closure.

1.0 INTRODUCTION

On behalf of Chevron Environmental Management Company (Chevron), Science Applications International Corporation (SAIC) is pleased to submit this report for Chevron Service Station No. 9-3417 located on the southwest corner of the intersection of Del Obispo and Camino Capistrano in San Juan Capistrano, California (Plate 1). This report includes an Updated Site Conceptual Model (SCM), Site Characterization Report, Site Assessment Report, and the First Quarter 2003 Groundwater Monitoring Report. The purpose of the report is to characterize the geologic, hydrogeologic, and environmental conditions at the site, develop target cleanup levels, and aid in selecting an appropriate corrective action plan for the site, if warranted. The SCM provides a framework for discussing the project site conditions and is intended to be a living document that evolves, as new data becomes available. This report also summarizes the environmental activities performed at the former service station. The goals of the SCM are to:

- Identify how the distribution of subsurface petroleum hydrocarbons is changing in space and time,
- Identify potential current and future receptors,
- Identify environmental issues of concern.

2.0 SITE CONCEPTUAL MODEL

2.1 SITE DESCRIPTION

The site is an active service station located at 32001 Camino Capistrano on the southwest corner at the intersection of Camino Capistrano and Del Obispo in San Juan Capistrano, California (Plate 1). The station currently consists of three double-walled fiberglass gasoline underground storage tanks (USTs, one 10,000-gallon supreme unleaded, one 10,000-gallon plus unleaded, and one 10,000-gallon regular unleaded) located in the central northeastern portion of the site and one 250-gallon used-oil aboveground storage tank (AST) located in the south central portion of the site behind the station building. There are four dispenser islands (two in the northern portion and two in the southeastern portion of the site) and a station building in the central southwestern portion of the site. The site is surrounded by commercial and retail operations. Arroyo Trabuco (Trabuco Creek) and San Juan Creek are located approximately 90 feet east and 1,600 feet southeast of the site, respectively. A site vicinity map is provided on Plate 2.

The station began operations in 1972 and maintains the original UST basin and dispenser island locations. Since October 1988, eleven groundwater monitoring wells have been installed (MW-1 through MW-8, CMW-9, CMW-11, and AMW-1). Only nine groundwater monitoring wells are currently active (MW-2 through MW-5, MW-7, MW-8, CMW-9, CMW-11, and AMW-1). Wells MW-1 and MW-6 have been abandoned. There have been 23 additional soil borings (B-1, B-2, CMW-10, SB-1 through SB-4, CPT-1 through CPT-7, CB-1 through CB-6, and PB-7 through PB-9) drilled at the site, and 119 soil samples collected and laboratory analyzed. Historical soil and groundwater analytical data are provided on Tables 1 and 2, respectively. Historical groundwater inorganic analytical data are provided on Table 3, and well construction details are provided on Table 4. A site plan showing groundwater monitoring wells, soil borings, soil samples, and cross section locations is provided on Plate 3.

2.2 REGIONAL AND SITE-SPECIFIC GEOLOGY

The site is at an elevation of approximately 90 feet above mean sea level (MSL), and the United States Geological Survey (USGS) coordinates for the site are Township 8 South, Range 8 West, and Section 12, 7.5' minute Quadrangle Map for San Juan Capistrano and Dana Point (USGS, 1981, Plate 1). The station is located within the floodplain of Trabuco Creek in the northern Peninsular Range of southern Orange County California (Plates 4 and 5). Near the station, the floodplain extends approximately two miles across and is bound by the San Joaquin Hills approximately 1.25 miles to the west and the foothills of the Santa Ana Mountains approximately 0.75 mile to the east of the site. Other structural features in the area include the Christianitos Fault Zone located approximately 3 miles east of the site, and the confluence of

Trabuco Creek and San Juan Creek is approximately 3,000 feet south of the station (California Department of Water Resources [CDWR], 1972, 1988, and 2002).

The San Juan Capistrano area is underlain by Tertiary-age sedimentary rocks that are gently folded in a broad synclinal trough with a north-trending axis (Plates 4 and 5). The station is within the central portion of the syncline that is underlain by primarily marine siltstone and sandstone of the Capistrano Formation of late Miocene and early Pliocene age. In the vicinity of the service station, the Capistrano Formation is capped unconformably by a thin sequence of nonmarine Pleistocene and Recent age alluvial sediments associated with Trabuco Creek (CDWR, 1972, 1988, and 2002).

Soils observed during previous assessments were primarily interbedded fine-grained silt layers and clay to approximately 15 feet below ground surface (bgs) followed by coarser grained silt and sand with some gravel to a maximum depth explored of approximately 35 feet bgs. A compilation of historical groundwater monitoring well and soil boring logs are provided in Appendix A. A tabulation of groundwater monitoring well construction details are provide on Table 4. These site-specific lithologies appear in cross section on Plates 6 through 9.

2.3 REGIONAL AND SITE-SPECIFIC HYDROGEOLOGY

The site is located within the lower Trabuco Creek Division of the San Juan Groundwater Basin, defined as the area downgradient of the confluence of Oso and Trabuco Creeks (Plates 4 and 5). The San Juan Groundwater basin underlies the San Juan Valley and several tributary valleys in southern Orange County. The primary water-bearing layer with the basin is Quaternary alluvium. This alluvium is composed of a heterogeneous mixture of sand, silt, and gravel ranging in thickness from 65 feet to 125 feet. Production wells typically yield from 450 to 1,000 gallons per minute. Sand layers of the Tertiary Santiago Formation may be water-bearing within the region and beneath the basin along with minor amounts of water being extracted from fractured basement rock beneath the basin (CDWR, 1972, 1988, and 2002).

Groundwater within the basin typically flows southwest toward the Pacific Ocean. Recharge within the basin occurs from the San Juan Creek, Oso Creek, and Trabuco Creek watersheds (Plates 4 and 5).

Groundwater mineral content is variable and typically contains calcium bicarbonate or bicarbonate-sulfate below the upper reaches of the valleys, and calcium-sodium sulfate or sulfate-chloride near the coast. Generally, groundwater quality in the area has been reported as poor and does not meet drinking water standards and is considered of non-beneficial use. Total dissolved solids (TDS) content in groundwater ranges from 500 milligrams per liter (mg/L) in the upper valleys to 2,000 mg/L near the coast. TDS

content from three unnamed public supply wells average 760 mg/L and ranged from 430 mg/L to 1,250 mg/L. Groundwater in the western part of the basin has high TDS content, and groundwater from springs in Thermal Canyon has high fluorine content (CDWR, 1972, 1988, and 2002).

Quarterly groundwater monitoring activities were initiated at the site in October 1988. There are currently nine active groundwater monitoring wells onsite and offsite. Groundwater is typically encountered at approximately 14 feet bgs and appears to flow to the south at an approximate gradient of 0.007 foot per foot (ft/ft). Historical groundwater elevations have been measured at a minimum depth of 10.82 feet bgs in AMW-1 in April 1998 and at a maximum depth of 18.21 feet bgs in MW-6 in June 1991. A tabulation of historical groundwater elevations is provided in Table 2, and well construction details are provided in Table 4.

2.4 WELL AND CONDUIT SURVEY

In 1997, a survey of active and inactive wells within the site vicinity was obtained from the San Juan Basin Authority (SJBA), as cited from a QST Environmental, Inc. (QST) report (QST, 1997b). A recent well survey request in February 2003 was denied as a result of national security following September 11, 2001. In 1997, there were six wells identified in the survey (QST, 1997b). These wells are shown on Plate 10, and these data are provided in Appendix B. A tabulation of well types and status are as follows:

- 3 Active Production Wells
- 2 Inactive Production Wells
- 1 Active Irrigation Well

Active production well No. 24 (Marabella Country Club) is located upgradient approximately 1,700 feet north of the site, and active production wells No. 1 and 2 (Rosenbaum) are located upgradient approximately 2.2 and 2.7 miles north of the site, respectively. Inactive production wells No. 8 and 9 (Rancho Los Cerritos) are located crossgradient approximately 1,800 feet east of the site. Active irrigation well No. 3 (Kinoshita) is located downgradient approximately 0.9 mile southwest of the site (SJBA, 1997). Well logs and construction details were not available for review regarding any of these wells. There appears to be no active production wells downgradient of the site, and it is unlikely that any residual petroleum hydrocarbons within the subsurface beneath the site would migrate upgradient to any of the production wells north of the site.

2.5 UNDERGROUND STORAGE TANK HISTORY

In 1972, the original service station operated four single walled USTs (one 10,000-gallon super unleaded,

one 10,000-gallon regular unleaded, one 5,700-gallon leaded, and one 1,500-gallon used-oil). Environmental investigations were initiated at the site in September 1988 when a 2,000-gallon regular unleaded gasoline release was reported and repaired. In December 1988, another release of 800 gallons of supreme unleaded was reported and repaired. Following an investigation, both releases were apparently due to gauging stick damage at the bottom of the USTs, shown on Plate 3 (Owens-Corning Fiberglas Corporation [Owens-Corning], 1988). In June 1990, the original 1972 tanks and associated product piping were replaced with four double-walled fiberglass USTs; one 10,000-gallon supreme unleaded, one 10,000-gallon plus unleaded, one 10,000-gallon regular unleaded, and one 1,000-gallon used-oil UST along with associated piping. During the UST removal activities, no visible signs of degradation were noted on the tanks, except for the two repair patches on the regular and supreme unleaded USTs (Groundwater Technology, Inc. [GTI], 1990). In December 1998, the 1,000-gallon used-oil UST was replaced with a 250-gallon AST (QST Environmental Inc. (QST), 1999b). In December 2001, the station underwent dispenser island upgrades (Harding ESE Inc. [Harding ESE], 2002a). Historical tank testing data are provided in Appendix C.

2.6 PREVIOUS SITE ACTIVITIES

In September 1988, a release of approximately 2,000 gallons of regular unleaded gasoline was reported as a result of an inventory discrepancy. Tank testing data indicated a leak in the regular unleaded gasoline UST, and the tank was subsequently repaired (Applied Geosciences, Inc. [AGI], 1989).

In October 1988, four groundwater monitoring wells (MW-1 through MW-4) were installed under the supervision of AGI. Total petroleum hydrocarbons as gasoline (TPHg) was not detected in any soil samples analyzed. Benzene was not detected in any soil samples analyzed, except for MW-1 (0.0065 milligrams per kilogram [mg/kg]) collected at 15 feet bgs (AGI, 1989). Historical soil analytical data are provided on Table 1, and these data also appear in plan view on Plate 11.

In October 1988, quarterly groundwater monitoring activities were initiated at the site following the development of MW-1 through MW-4 (AGI, 1988). Historical groundwater gauging and analytical data are provided on Table 2, and historical inorganic analytical data are provided in Table 3.

In December 1988, another release of 800 gallons of supreme unleaded gasoline was reported, and the tank was repaired. Following an investigation, it was determined that both the September and December 1988 releases were apparently due to gauging stick damage. The approximate location of the damage is shown on Plate 3 (Owens-Corning, 1988).

In January 1989, three groundwater monitoring wells (MW-5 through MW-7) were installed under the

supervision of AGI. TPHg (0.54 mg/kg and 0.21 mg/kg) was the only constituent analyzed, and it was detected in soil samples MW-5 and MW-6 collected at 15 feet bgs, respectively (AGI, 1989). These soil samples are shown in plan view on Plate 11.

In May 1989, groundwater monitoring well (MW-8) was installed under the supervision of AGI. TPHg (60 mg/kg) and benzene (1.9 mg/kg) concentrations were only detected in the soil sample collected at 14 feet bgs (AGI, 1989). These soil samples are shown in plan view on Plate 11.

In June 1990, GTI provided oversight during the UST and product piping replacement activities at the site. During replacement activities, there were no signs of degradation reported on the USTs, except for the two repair patches regular and supreme unleaded USTs. Two soil borings (B-1 and B-2) were advanced prior to UST removal activities. The highest concentration of TPHg (1,540 mg/kg) and benzene (5.877 mg/kg) were detected in soil boring B-2 at 15 feet bgs. Upon removal of the USTs, approximately 0.5 foot of free product was observed in the excavation pit. Approximately 1,650 gallons of gasoline and water were pumped from the excavation area and approximately 398 tons of soil was removed from the site. Six soil samples (TK-1, TK-2, TK-2A, TK-3, TK-4, TK-4A) were collected from the tank pit bottom, two soil samples (TP-2 and TP-3) were collected from the tank pit side walls, and four soil samples (PL-1 through PL-4) were collected from beneath the former product lines. No samples collected from the tank pit contained detectable concentrations of TPHg. However, all samples collected from beneath the product lines contained detectable concentrations of TPHg at a high concentration of 88 mg/kg collected from sample PL-1 at 2.5 feet bgs. The highest concentration of benzene (1.8 mg/kg) was detected in sample TK-3 at 14 feet bgs. Groundwater monitoring well MW-1 was destroyed during the UST excavation activities (GTI, 1990). These soil samples are shown in plan view on Plate 12.

In August 1991, four soil borings (CMW-9, CMW-10, CMW-11, and AMW-1) were drilled offsite and downgradient of the site under the supervision of Converse Environmental West (CEW). Soil borings CMW-9, AMW-1, and CMW-11 were developed as groundwater monitoring wells. The highest concentration of TPHg (20 mg/kg) and benzene (3.7 mg/kg) were detected in soil sample CMW-10 at 10.5 feet bgs (CEW, 1991). These soil samples are shown in plan view on Plate 13.

From August to September 1992, vacuum extraction tests (VETs) using MW-3, MW-6, MW-7, and MW-8 were conducted to determine the feasibility of vacuum extraction as a remedial option. The radius of influence (ROI) was calculated to be approximately 48 feet with a flow rate of approximately 8 cubic feet per minute. An applied vacuum of 168 inches of water indicated that vacuum would have limited effect due to the clay and silty soils. Influent concentrations of TPHg (1,600 parts per million by volume

[ppmv]) and benzene (250 ppmv) were detected from MW-7 (CEW, 1992).

In April 1993, four continuous-core auger borings (SB-1 through SB-4) and seven cone penetrometer test borings (CPT-1 through CPT-7) were drilled under the supervision of CEW. The highest concentrations of TPHg (330 mg/kg) and benzene (1.2 mg/kg) were detected in soil boring SB-4 at 12.5 feet bgs.

Apparently, no soil samples from CPT-5 through CPT-7 were laboratory analyzed (CEW, 1993). These soil samples are shown in plan view on Plate 14.

From August to September 1993, three aquifer tests consisting of one step-drawdown (MW-7) and two constant rate drawdown (MW-6 and MW-7) tests were conducted to assess the feasibility of pump-and-treat remediation. Based on constant-rate test, the lateral extent of petroleum hydrocarbons would likely be within the capture zone of a pump and treat system for MW-8 at a pumping rate of 5 gallons per minute for remediation. Drawdown was 1.3 feet in MW-7 and 5.1 feet in MW-6 (CEW, 1994).

From February through May 1996, Flour Daniel GTI (Flour Daniel) operated a vapor extraction system (VES) consisting of two activated carbon canisters and four wells (MW-4, MW-6, MW-7, and MW-8) used as extraction wells at this site. Approximately 980 pounds of petroleum hydrocarbons were removed and destroyed during this period. During VES operation, individual well measurements of petroleum hydrocarbon vapor concentrations decreased from 10,000 ppmv at the time of VES startup to 120 ppmv at system shutdown (Flour Daniel, 1996). Historical vapor extraction data are provided in Appendix D.

In April 1997, QST Environmental, Inc. (QST) submitted a case closure request; however, the request was denied by OCHCA (QST, 1997a).

In December 1998, groundwater monitoring well MW-6 was abandoned under the supervision of QST (QST, 1999b).

In December 1998, QST performed oversight during the replacement of a 1,000-gallon used-oil UST with a 250-gallon AST. The UST was reported to be in excellent condition at the time of removal. Two soil samples (WO-1 and WO-2) were collected in the former UST location and were analyzed for total recoverable petroleum hydrocarbons (TRPH). TRPH was not detected in either soil sample analyzed (QST, 1999a). These soil samples are shown in plan view on Plate 15.

In November 2000, a preliminary site conceptual model (SCM) was prepared by Risk Assessment and Management Group (RAM); however, their report was never reviewed, signed, and/or stamped by a

California Registered Geologist (R.G.) (RAM, 2000).

In October 2001, an evaluation of surrounding known environmental cases of concern was performed through Environmental Data Resources (EDR). Two leaking underground storage tanks (LUST) cases were identified upgradient of the site. These include a Shell station located approximately 0.35 mile and a Tosco/76 station located 0.4 mile north of the site. In addition, three properties were noted on the waste management/landfill (WMUDS/SWAT) database and one on the Cal-sites database (other sites of concern). The three WMUDS/SWAT properties are Del Obispo, located 0.22 mile west and crossgradient of the Chevron site; Sycamore Canyon San Landfill, located 0.3 mile southwest and downgradient of the Chevron site; and Forster Canyon Landfill, located 0.45 mile south and downgradient of the site. These sites are not anticipated to affect the Chevron site. The Cal-site listing is the Solag Disposal noted in two different locations varying from 0.16 to 0.6 mile northwest and downgradient of the site. This property was reportedly performing voluntary clean-up activities; however, this property could possibly affect the Chevron site (Harding ESE, 2001). These data are tabulated in Table 5, and please refer to Appendix E for details on the EDR report.

From December 10 through December 13, 2001, Harding ESE performed oversight during dispenser island containment upgrades. A total of 14 soil samples were collected beneath the dispenser islands. TPHg and benzene were not detected in any soil sample analyzed. The highest concentration of methyl tertiary-butyl ether (MtBE), 0.216 mg/kg, was detected in soil sample Disp 7-8WW5 at 2 feet bgs collected beneath the southeastern dispenser islands. Approximately 22.50 tons of soil was excavated and transported offsite (Harding ESE, 2002a). These soil samples are shown in plan view on Plate 15.

In September 2002, six confirmation soil borings (CB-1 through CB-6) were drilled under the supervision of Harding ESE. The highest concentration of TPHg (5,230 mg/kg) was detected in soil boring CB-1 at 16 feet bgs. The highest concentrations of benzene (0.119 J mg/kg) and MtBE (1.26 mg/kg) were detected in soil boring CB-4 at a depth of 16 feet bgs (Harding ESE, 2002b). These soil samples are shown in plan view on Plate 16.

In January 2003, three soil borings (PB-7 through PB-9) were drilled at the site under the supervision of MACTEC Engineering and Consulting, Inc. (MACTEC), formerly Harding ESE. The highest concentration of TPHg (2,300 mg/kg) was detected in soil boring PB-9 at 13.5 feet bgs. The highest concentration of benzene (0.1 mg/kg) was detected in soil boring PB-8 at 16.5 feet bgs. The highest concentrations of MtBE (0.18 mg/kg) and tertiary butyl alcohol (TBA, 0.43 mg/kg) were both detected in soil boring PB-9 at and 11.5 feet bgs. Ethyl tertiary butyl ether (ETBE), diisopropyl ether (DIPE), and

tertiary amyl methyl ether (TAME) were not detected in any soil samples analyzed. These soil samples are shown in plan view on Plate 16. Please refer to Appendix F for details on these site assessment activities.

The First Quarter 2003 Groundwater Monitoring Report is provided in Appendix G. This report includes the most recent groundwater monitoring data, as well as hydrographs showing historical trends for petroleum hydrocarbons in groundwater.

2.7 DISTRIBUTION OF PETROLEUM HYDROCARBONS

2.7.1 Soil

The distribution of petroleum hydrocarbons in soil is based on 119 soil samples collected and analyzed at the site since 1988. To date, petroleum hydrocarbons have primarily been detected in soil samples collected within the UST basin, north-northeast of the UST basin beneath the product piping, and beneath the southeastern dispenser islands.

The OCHCA uses the aqueous-phase saturation ratio (APSR) criteria to assess the presence of non-aqueous phase liquids (NAPL) that OCHCA define as petroleum-saturated soil, and to aid in determining if active remediation is required. The APSR is a proportion between the known amount of petroleum hydrocarbons present in soil and the theoretically maximum amount present in the soil moisture to determine if the soil is saturated with petroleum hydrocarbons. The APSR is a theoretical value that is defined by the following equation:

$$APSR = C_{tw}/(S_i \cdot MF \cdot W)$$

where:

C _{tw}	= contaminant concentration in the soil (mg/kg wet weight)
S _i	= solubility of a compound (mg/L)
MF	= mole fraction of a compound
W	= soil water content (L/kg)

Using these criteria, a site would be considered to contain NAPL if any compounds have an APSR value greater than 4. Using this approach, SAIC calculated the threshold concentrations corresponding to these APSR values for the site using the following assumptions:

Compound	Solubility (mg/L)	Mole Fraction	Water Content	APSR (mg/kg)
Benzene	1,780	0.015	0.15	16.02
Toluene	535	0.070	0.15	22.47
Ethylbenzene	161	0.013	0.15	1.25
Total Xylenes	146	0.075	0.15	6.57

The APSR for benzene was not exceeded in any soil samples analyzed. The APSR was exceeded in soil samples for toluene (PB-9 at 13.5 and 16.5 feet bgs), ethylbenzene (PL-2 at 2.5 feet bgs, CB-1-S CB-2-S at 16 feet bgs, and PB-9 at 13.5 and 16.5 feet bgs) and total xylenes (PL-2 at 2.5 feet bgs, CB-2-S at 16 feet bgs, and PB-9 at 13.5 and 16.5 feet bgs).

These soil samples were primarily collected within and northeast of the UST basin, beneath the product piping north-northeast of the USTs, and beneath the southeastern dispenser islands. The UST basin and product piping areas were excavated during UST and product piping replacement activities in 1990. VES activities in 1996 removed and destroyed approximately 980 pounds of petroleum hydrocarbons, and an additional remedial excavation was conducted on the southeastern dispenser islands during containment system upgrade activities. A site map showing soil samples collected within the vadose and saturated zones for TPHg, benzene, and MtBE showing is provided on Plates 17 and 18, respectively.

2.7.2 Groundwater

Groundwater monitoring has been conducted at the site since October 1988, and there are currently nine active groundwater monitoring wells onsite and offsite. Groundwater is typically encountered at approximately 14 feet bgs and appears to flow to the south at a gradient of approximately 0.007 ft/ft.

The groundwater cleanup goals used by the Santa Ana Region of OCHCA are the "low-risk threshold levels". Although the site is not located within the Santa Ana Region of OCHCA, these goals may be applicable as groundwater within the area is typically not drinking water quality. These groundwater cleanup goals for BTEX are 250 micrograms per liter ($\mu\text{g/L}$), 300 $\mu\text{g/L}$, 680 $\mu\text{g/L}$, and 1,750 $\mu\text{g/L}$, respectively. The low risk threshold levels for benzene, toluene, and total xylenes have only been exceeded in MW-8 located south and downgradient of the UST basin and is currently exceeded for benzene and toluene.

The highest concentrations of petroleum hydrocarbons in groundwater have primarily been detected in MW-8 located south and downgradient of the UST basin. The benzene groundwater plume extends onsite from MW-8 downgradient to MW-7 along the southern property boundary and does not appear offsite. However, the MtBE groundwater plume extends from MW-8, downgradient to MW-7, and offsite to CMW-9, CMW-11, and AMW-1. The historical maximum concentrations of TPHg (170,000 $\mu\text{g/L}$ in MW-8 [9/20/95]), benzene (37,000 $\mu\text{g/L}$ in MW-8 [11/5/93 & 6/29/94], and MtBE (24,100 $\mu\text{g/L}$ in CMW-11 [5/3/01] using Environmental Protection Agency (EPA) Method 8260B) in groundwater have been detected in these wells located south and downgradient of the UST basin. The maximum

concentration of MtBE observed in MW-8 may be anomalous because the next highest concentration using EPA Method 8260B was 680 µg/L in MW-8 on December 1, 1999.

Concentrations of ETBE and DIPE have never been detected in any monitoring wells onsite and offsite. Monitoring data in 2002 indicate minor concentrations (<2.3 µg/L) of TAME were detected in AMW-1, and concentrations of TBA were detected in MW-7 (<71 µg/L), MW-8 (<1,910 µg/L), CMW-11 (<131 µg/L), and AMW-1 (<50 µg/L).

Petroleum hydrocarbons have rarely been detected in groundwater monitoring wells located along the northern (MW-5), eastern (MW-4), and western (MW-2) portions of the site, and these areas appear to be adequately assessed. Monitoring data from 2002 indicate benzene concentrations onsite in MW-8 only and MtBE concentrations offsite in CMW-9, CMW-11, and AMW-1 appear to have stabilized and decreasing. If this decreasing trend continues in these offsite wells, then the southern extent of petroleum hydrocarbons in groundwater will be adequately assessed.

A presentation of historical trends of groundwater elevations, TPHg, benzene, and MtBE throughout seasonal changes and time are presented as Plate 19 through 29. These data also appear as hydrographs in Appendix G.

3.0 SITE CHARACTERIZATION AND PLUME TRAVEL TIME

3.1 RISK EVALUATION

In order to evaluate health risks associated with current conditions at the site, an evaluation of the various exposure pathways and the threats to human health and the environment needs to be considered.

Ingestion or dermal contact is not considered to be a significant threat due to the fact that the near-surface soil that could potentially contain petroleum hydrocarbons is paved. The inhalation of petroleum hydrocarbon vapors from cracks or seams in the pavement is not considered to be a significant threat as pumping gas would emit more petroleum hydrocarbons vapors than those through cracks in the pavement. Furthermore, any vapors would be mixed and diluted with ambient air and would not be present at concentrations detrimental to human health. Any vapors could pose an explosion threat to underground utilities and a health threat to workers if vapor were to enter confined spaces such as pipelines or man-ways. However, this exposure pathway is not significant due to the fact that utility enclosures do not appear to be in the areas where petroleum hydrocarbons were detected. As was the case for soil, the inhalation of vapors generated from groundwater or dermal contact are not considered to be significant risks due to limited potential for exposure as well as the low concentrations at which any petroleum hydrocarbons are detected. Furthermore, the threat caused by the potential for ingestion of groundwater does not appear to be significant.

3.2 CLEANUP CRITERIA

The APSR's discussed in Section 2.7.1 are the cleanup levels that are typically used by the OCHCA. However, SAIC believes that groundwater conditions will determine the need for remediation at the site. On March 27, 2001, the State Water Resources Control Board (SWRCB) issued *Guidelines for Investigation and Cleanup of MtBE and Other Ether-Based Oxygenates* as a final draft. Using these guidelines, sites are classified as Class A (highest priority), Class B, Class C, or Class D (lowest priority) to aid in the prioritization of cleanup (SWRCB, 2000). These guidelines also rank sites as being most vulnerable based on having one or more of the following characteristics:

- The site is within 3,600 feet of a drinking water well or a surface water body used as a source of drinking water,
- The site is located on near-surface fractured bedrock that is a source of water supply,
- The site is located above an aquifer that is a source of water supply for a community, or
- The site is designated as having a high degree of susceptibility to contamination as shown on a statewide map.

Based on previous site investigations, the site does not appear to be an immediate risk to humans and/or the environment and should be considered a low risk site. Following two years of quarterly groundwater monitoring, the site should be reevaluated for case closure.

3.3 SITE CHARACTERIZATION

The lateral and vertical extent of petroleum hydrocarbons in soil appears to be adequately assessed at the site. From 1988 through January 2003, 119 soil samples have been collected and laboratory analyzed, approximately 320.3 cubic yards of petroleum hydrocarbon containing soil has been excavated from the subsurface during UST and product piping replacement and in 1990 and dispenser island containment upgrades in 2001, and VES activities destroyed approximately 980 pounds of petroleum hydrocarbons.

Fifteen years of groundwater monitoring appears to have adequately assessed the site in the northern, eastern, and western portions of the site. Benzene concentrations are only detected in MW-8 onsite, and MtBE concentrations have migrated to the south, downgradient, and offsite in CMW-9, CMW-11, and AMW-1. Monitoring data from 2002 indicate that concentrations are stabilizing and decreasing. The site may be considered assessed to the south if these decreasing trends continue in CMW-9, CMW-11, and AMW-1.

OCHCA requested a response to several site-specific questions. These included 1) a hydrogeological evaluation that addresses whether or not petroleum hydrocarbons in groundwater will migrate to any surface waters, 2) a calculation of the approximate time it will take for petroleum hydrocarbons in groundwater to degrade to background levels at the site, and 3) an evaluation of the need for a vertical assessment of the MtBE contaminated groundwater.

A hydrogeologic evaluation addressing whether or not petroleum hydrocarbons in groundwater will migrate to any surface waters was performed. The nearest existing surface waters are Trabuco Creek and San Juan Creek located approximately 90 feet east and 1,600 feet southeast of the site, respectively. The Lawrence Livermore National Laboratory plume study (Rice et al. 1995) found that petroleum plume lengths tend to stabilize at relatively short distances, rarely exceeding 260 feet in length. Based on the source mass of petroleum hydrocarbons remaining beneath the site and the intrinsic bioremediation that has been observed in similar sites, and on the review of available hydrologic data for the San Juan Basin, the nature of the localized water table beneath the site, existing climatic conditions, the low infiltration rate of natural and artificial runoff, topography, geology, and local water usage information, all suggest that dissolved-phase petroleum hydrocarbons in groundwater beneath the site will not migrate to any

surface waters. Plates 4 and 5 are block diagrams showing a generalized schematic of these conditions within the San Juan Basin.

Calculations of the approximate time it will take for petroleum hydrocarbons in groundwater to degrade to background levels were performed at the site. Actual time for natural attenuation to take place varies greatly from site to site depending on many factors from available oxygen, porosity of soils, native bacterial fauna, contaminant mass concentrations, and others such as groundwater chemistry and groundwater flow dynamics. The linear regression curve using MW-8 suggests that by year 2006 benzene concentrations and by year 2010 MtBE concentrations will have naturally degraded to below the laboratory detection limits. These projections appear to be over exaggerated, but these projections were based on the hydrograph from the well with the highest concentrations of detected petroleum hydrocarbons (MW-8). Using AMW-1, CMW-9, and CMW-11 for MtBE would reduce the projection to 2007, and benzene is primarily detected in MW-8 only. Hydrographs used for these projections are provided in Appendix G.

An evaluation of the need for additional vertical assessment of the MtBE plume beneath the site was performed. Based on a review of the historical soil and groundwater analytical data, the site has undergone several phases of assessment and additional vertical assessment does not appear necessary at the site. MtBE concentrations at the site are primarily detected in MW-8 and MW-7 onsite and extending downgradient to the south to CMW-9, CMW-11, and AMW-1. Although MtBE migration offsite has occurred, concentrations detected during monitoring in 2002 indicate a decreasing trend.

4.0 INTERIM REMEDIAL ACTION PLAN

Based on previous site assessment activities, the site appears to be adequately assessed. An interim remedial action plan does not appear to be warranted at this time. Continued quarterly groundwater monitoring is recommended for the site.